

What Is Claimed Is:

1. A differential assembly comprising:
 - a pair of coaxial axles;
 - a pair of gear train units disposed on the respective axles, each of the gear train units including
 - a sun gear fixed on each of the axles,
 - a holder relatively rotatably provided on each of the axles, and
 - a planetary gear supported by the holder to mesh with the sun gear; and
 - a common bull gear integrally engaging with the holders of the pair of gear train units.
2. The differential assembly according to claim 1, wherein the holders of the pair of gear train units are joined to each other through a surface perpendicular to the pair of axles.
3. The differential assembly according to claim 2, wherein the holders are symmetrical with respect to the surface.
4. The differential assembly according to claim 1, wherein the holders are made of sintered metal.
5. The differential assembly according to claim 1, wherein the planetary gears of the pair of gear train units are drivingly connected to each other.
6. The differential assembly according to claim 5, wherein each of the planetary gears of the gear train units has an integrally rotatable coaxial transmission gear so that the transmission gears of the gear train units mesh with each other.

7. The differential assembly according to claim 5, wherein power transmission between the gear train units is resisted so as to limit differential rotation of the axles.

8. The differential assembly according to claim 7, wherein the sun gears and the planetary gears of the pair of gear train units are helical gears, wherein the helical planetary gears are axially movably supported, and wherein, when differential torque is generated between the axles, each of the helical planetary gears axially moves so as to frictionally abut against another member.

9. The differential assembly according to claim 8, wherein the member to frictionally abut against the axially moved helical planetary gear is the holder.

10. The differential assembly according to claim 8, wherein each of the planetary gears has a rotary axis parallel to the axles.

11. The differential assembly according to claim 10, wherein a shaft serving as the rotary axis of each of the planetary gears is axially movably supported at opposite ends thereof by the pair of holders.

12. The differential assembly according to claim 7, wherein each of the sun gears is a worm wheel, and wherein each of the planetary gears is a worm pinion.

13. The differential assembly according to claim 12, wherein each of the worm pinions serving as the planetary gears has a rotary axis perpendicular to the axles.

14. The differential assembly according to claim 13, wherein a shaft serving as the rotary axis of each of the planetary gears is supported by each of the holders.

- 15.** A transaxle comprising:
- a transmission;
 - a pair of coaxial axles;
 - a deceleration assembly for decreasing output rotational speed of the transmission;
 - a differential assembly for transmitting power from the deceleration assembly to the pair of axles, the differential assembly including
 - a bull gear receiving output of the deceleration assembly, the bull gear being relatively rotatably supported around the axles, and
 - a pair of gear trains, each of which drivingly connects the bull gear to each of the axles, wherein the pair of gear trains are drivingly connected to each other so that power transmission between the gear trains is restricted; and
 - a common housing incorporating the transmission, the pair of coaxial axles, the deceleration assembly and the differential assembly.
- 16.** The transaxle according to claim 15, wherein the transmission in the housing includes at least one of mutually fluidly connected hydraulic pump and motor.
- 17.** The transaxle according to claim 16, wherein the transmission, the deceleration assembly and the differential assembly share common oil in the common housing.
- 18.** The transaxle according to claim 15, wherein the housing has a first portion to abut against the differential assembly so as to locate the differential assembly in the housing.
- 19.** The transaxle according to claim 18, wherein the housing has a second portion opposite to the first portion in the axial direction of the axles so as to locate the differential assembly in the housing.

20. The transaxle according to claim 15, wherein the housing is vertically dividable through a horizontal surface.

21. The transaxle according to claim 15, each of the gear trains of the differential assembly comprising:

a sun gear fixed on each of the axles, the pair of sun gears being disposed in the bull gear; and

a planetary gear supported by the bull gear so as to mesh with the sun gear, wherein the planetary gears of the pair of gear trains are drivingly connected to each other so that power transmission between the planetary gears is restricted.

22. The transaxle according to claim 21, wherein each of the planetary gears has an integrally rotatable coaxial transmission gear so that the transmission gears of the planetary gears mesh with each other.

23. The transaxle according to claim 21, wherein the sun gears and the planetary gears are helical gears, wherein the helical planetary gears are axially movably supported, and wherein, when differential torque is generated between the axles, each of the helical planetary gears axially moves so as to frictionally abut against another member.

24. The transaxle according to claim 23, wherein each of the planetary gears has a rotary axis parallel to the axles.

25. The transaxle according to claim 21, wherein each of the sun gears is a worm wheel, and wherein each of the planetary gears is a worm pinion.

26. The transaxle according to claim 25, wherein each of the worm pinions serving as the planetary gears has a rotary axis perpendicular to the axles.

27. The transaxle according to claim 21, each of the gear trains of the differential assembly further comprising:

a holder relatively rotatably provided on each of the axles, wherein the holders of the pair of gear trains integrally engage with the common bull gear.

28. The transaxle according to claim 27, wherein the holders of the pair of gear train units are joined to each other through a surface perpendicular to the pair of axles.

29. The transaxle according to claim 28, wherein the holders are symmetrical with respect to the surface.

30. The transaxle according to claim 27, wherein the holders are made of sintered metal.

31. The transaxle according to claim 27, wherein the sun gears and the planetary gears are helical gears, wherein the helical planetary gears has a shaft which is disposed in parallel to the axles and axially movably supported at opposite ends thereof by the pair of holders, and wherein, when differential torque is generated between the axles, each of the helical planetary gears axially moves so as to frictionally abut against another member.

32. The transaxle according to claim 31, wherein the member to frictionally abut against the axially moved planetary gear is the holder.

33. The transaxle according to claim 27, wherein each of the sun gears is a worm wheel, and wherein each of the planetary gears is a worm pinion having a shaft which is disposed perpendicular to the axles and supported by each of the holders.

34. The transaxle according to claim 27, wherein the bull gear has a central hole, in which the holders of the pair of gear trains are integrally fitted, and a toothed outer-peripheral edge for receiving output rotation of the deceleration assembly.